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kidney (although its vessels share in the dilatation) undergoes passive shrinking. There is no evidence of decussation of vaso-motor fibres in the splanchnic, *i.e.*, the right splanchnic sends fibres to the right kidney only, not to the left.

**Physiology of the Heart of the Snake.**—In the *Canadian Record of Science*, Vol. II., No. 8, Oct. 1887, is given an account by T. Wesley Mills of a study of the heart of the snake, which closes with the following summary:

1. The investigations recorded in this paper were made in mid-winter, on fasting but not hibernating animals.

2. Comparison of the vagi showed that in every instance both nerves were efficient; but usually the right was the more so; in some cases the difference, if actual, was minimal.

3. Stimulation of the vagi leads to after increased force and frequency of beat, or the former only, and according to the law of inverse proportion previously announced by the writer.

4. The mode of arrest of the heart is identical with that noted in chelonians, fish, etc.; the same applies to the mode of recommencement.

5. During vagus arrest, the *sinus* and *auricles* are inexcitable.

6. There are certain peculiar cardiac effects not explicable by reference to the vagi nerves alone, but which put the sympathetic system of nerves in a new light.

7. Direct stimulation of the heart confirms results previously noted by the writer for other cold-blooded animals. Arrest is, in all the animals of this class yet examined, owing to stimulation of the terminals of the vagi within the heart's substance.

8. As regards independent cardiac rhythm, the results have been negative.

9. The heart of the snake, upon the whole, seems to lie physiologically between that of the frog and that of the chelonians. X.

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## ARCHÆOLOGY AND ETHNOLOGY.

**Aboriginal remains near Old Chickasaw, Iowa.** On the west side of the Little Cedar River, about one and one-half miles below Old Chickasaw, Iowa, are located ten mound-builder mounds.

The same locality, by disease, war, emigration, or other causes, may have been depopulated and again repopled by other races, each

of which in its turn may have erected mounds for burial purposes, religious purposes, points of observation, or for other uses. The word mound-builders, therefore, as generally used, is calculated to lead to error by the implication that the habit of mound building was peculiar to *one* prehistoric race. In this paper the term mound-builder is applied to that prehistoric race (doubtless represented by numerous tribes) which, in ancient times, prior to the advent of the red Indians,<sup>1</sup> occupied much of that region now comprised within the bounds of the United States.

The mounds near Old Chickasaw are situated upon the border of the first terrace of the stream, as shown in Fig. 1, and which rises from twenty to forty-five feet above the flood plain at its base. Back from the first terrace, two hundred and sixty yards, is a second terrace, which rises sixteen or eighteen feet above the first one.

The country back from this terrace increases gradually in height until within three-fourths of a mile it has attained an elevation varying from twenty feet to more than one hundred feet above the last bench.

About two hundred and sixty yards to the southwest from the mounds, a never-failing spring of water issues forth from the base of the second terrace, and a short distance below a second one rises from the same region.

This entire region was formerly occupied by a heavy growth of timber; but much of it has now been cleared away by the settlers in opening up farms. The limited view (owing to the presence of timber) obtained from the site of these mounds, although pleasing, is yet far inferior to the beautiful and extensive scene afforded from the elevated land back from the stream a short distance.

All the mounds of this series are circular, with oval tops, and have a diameter varying from twenty-two feet to fifty-one feet, and a height of from one and three-fourths feet to five feet.

The distance between the different mounds is variable, being from two feet to fifty feet.

The main line of mounds, as will be observed by referring to Fig. 1, runs north a few degrees east. The remaining mounds are located approximate to and run parallel with the main line. In the centre of the first mound examined (No. 3) three human skeletons were found.

These bodies, many of the bones of which were in a good state of preservation, had been placed on the original surface in a sitting posture, and the mound reared over them.

<sup>1</sup>In the light of recent discoveries, it is difficult to say what portion of the so-called "Mound-builder race" was not identical with the red Indians.

The first body sat facing the east, and the second one directly in front, with knees nearly touching, facing the first one.

A few inches to the north of No. 1 a third one had been placed, apparently facing the east. The crania of all three individuals showed an extremely low grade of mental development; the foreheads being, in one case, even lower than in the specimen found in the Floyd mound, which was figured and described by the writer in a paper on "Ancient Mounds at Floyd, Iowa," that appeared in a late number of the AMERICAN NATURALIST.

The upper anterior portion (back of the eyes) of one of the crania under consideration was quite narrow, but rather rapidly expanded postero-laterally. That portion of the frontal bone forming the upper part of the eye sockets attained a height of only from four to seven mm.; and then sloped abruptly backward, forming a slightly *concave* area back of and above the eyes. This cranium, as well as the others obtained from this mound, was smaller (the largest  $6\frac{1}{4} \times 5$  in.), than the Neanderthal skull.

In Plate XXIX. is given a good representation of one of these strange crania.<sup>2</sup>

One of the individuals was apparently that of a woman in middle life, while the body on the left was that of an aged person.

The first one and one-half feet of material above the remains was a mixture of earth and ashes, made very hard, with a few small pieces of charcoal scattered through it.

The remaining three and one-half feet of material composing the mound was a yellow, clayey soil, unlike anything found on the surface in the vicinity.

Five feet below the surface of mound No. 4, and resting on the natural surface of the ground, were the remains of two persons which had been buried in a sitting position.

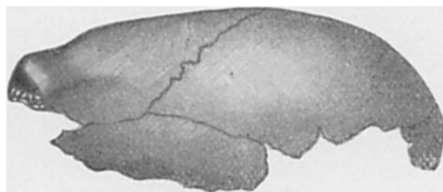
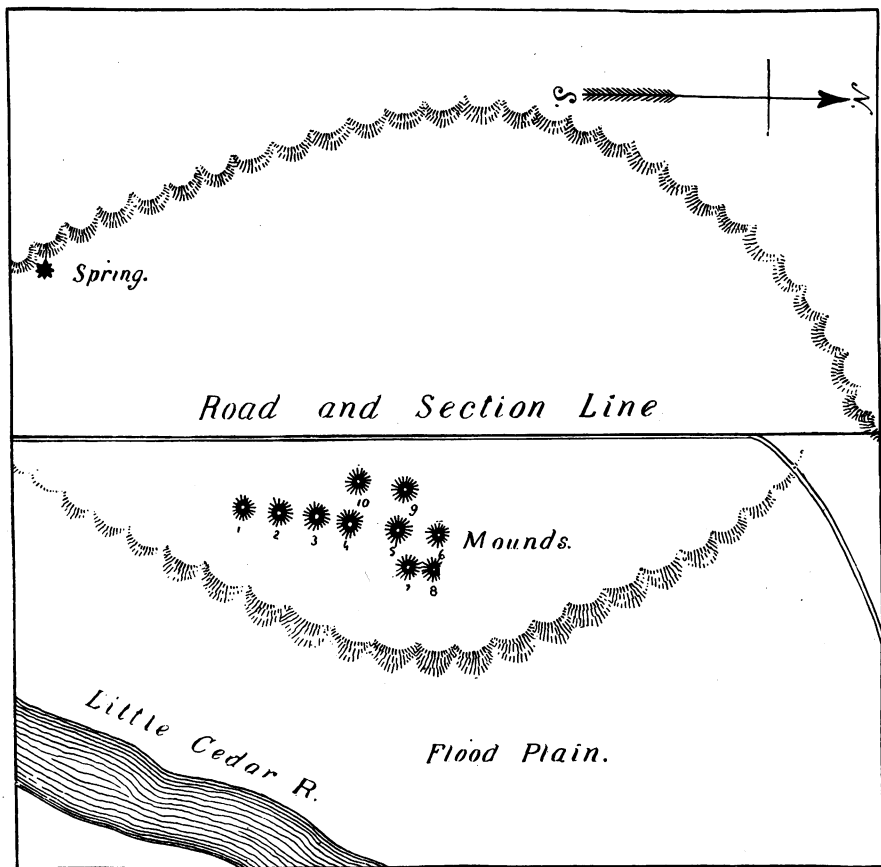
Some of the larger bones of the bodies were in a good state of preservation; the crania, however, were too badly crushed and decomposed to allow of a reconstruction of their parts.

The structure and size of the bones of these individuals indicated persons of great muscular development, and showed them to have been at least six feet in height.

The first three and one-fourth feet of the mound above the remains was yellow earth and ashes, made very hard, probably by tramping and the use of water.

<sup>2</sup> This cut does not represent the most inferior cranium secured.

PLATE XXIX.



MOUNDS AND MOUND-BUILDER'S SKULL.

The remaining one and three-fourths feet of material was yellow earth, not packed.

Scattered through the mound were numerous pieces of oak charcoal.

In various parts of the mound were local deposits or "patches" of ashes, and underneath them thin, deeply-stained layers of ashes and earth, having the appearance of being stained by the decomposition of flesh.

In mound No. 9 were found the remains of four bodies.

The teeth and bones of two of these individuals showed them to have been well advanced in years, while the third body was that of a person of middle age, and the fourth that of a subject somewhat younger.

The lower jaw of one of these individuals was very large and strong, with the angles much straightened. All the teeth, with one exception, were well preserved, although much worn on the crowns.

One large molar, which was otherwise sound, had a decayed cavity in the cervix 3 mm. in diameter.

Although we have personally examined the teeth of many mound-builders, this is almost the first example of decayed teeth belonging to these people which has come under our observation. Another interesting and finely preserved lower jaw obtained from this mound had a breadth measuring, from exterior to exterior, at the angles, twelve and one-half centimeters.

This maxillary had apparently been fractured during life; and this may perhaps account, in part, for its great width.

The angle of the jaw was very low and much straightened.

At the time of death only the incisors and canines remained; all the other teeth had been lost, and the alveolar processes either wholly or in part absorbed.

All the bodies had been placed in a sitting posture in the centre of the mound, on a small hillock, one and one-half feet in height, composed of ashes and earth.

Although all the bodies had been buried in the flesh, still a portion of the skull of one individual had been much charred by fire before being in the mound.

The first one and one-fourth feet of material composing the mound was soft, yellow earth, similar to that constituting the other mounds; and the remaining one and three-fourths feet was of the same material, mixed with ashes, and made quite hard.

Disseminated through the mass were a few small pieces of charcoal.

In mound No. 10, which was about forty-five feet in diameter and

three feet in height, were discovered the remains of three persons, the bones being in a better state of preservation than in any of the other mounds of the group explored.

First, there had been reared, from the ordinary black surface-soil of the vicinity, a small hillock, one foot in height; and on this were placed in a sitting posture, with the feet drawn under them, the three bodies.

One finely preserved lower jaw found in this mound was very massive and broad, and contained large, finely preserved teeth. The teeth in this specimen were all worn quite flat upon the crowns; and this remark applies to the incisors and canines, as well as cuspids and bicuspid.

In this case it is shown that the masticating surface of the upper jaw fitted perfectly that of the lower one.

The incisor teeth did not lap, but impinged on each other at their cutting edges, like the molars. This form of teeth is not peculiar to the mound-builders, however, but is characteristic of savage races generally.

The material composing this mound, although analogous to that of other mounds of the series, was not *packed* around the bodies.

It was plainly evident that much less care was exercised in this burial than in any of the others. Gathered facts, moreover, demonstrate that this mound, as well as some of the others, was erected long anterior to Nos. 3 and 4. Some years ago mound No. 2 was graded down by Mr. R. H. Gordon (on whose farm all the mounds are located) in making an excavation for a cellar.

The structure of the mound was similar to that of No. 4, although much smaller. On the original surface had been placed, in a sitting posture, one or two bodies.

The crania and many bones of the bodies are reported to have been in a good state of preservation.

Mound No. 1 is now twenty-two feet in diameter and one foot in height; but owing to the fact of its having been cultivated over for more than ten years, its original height has been somewhat reduced and its diameter slightly increased.

A few inches above the surface which environed the mound was discovered, upon exploration, a thick bed of charcoal, and a log over eight feet in length and twelve inches in diameter, which had been thoroughly burned.

This coal was mostly in a fine state of preservation. The wood used was of the same species of oak as now occupies the surface of the region. In this mound was observed scarcely a trace of ashes.

From all the evidence gained it was plain to be seen that this was not a place of sepulture ; but, on the contrary, was a place where wood was burned for the purpose of obtaining ashes to aid in the construction of at least some of the burial mounds.

No fire had been used on any of the burial mounds examined, both the charcoal and ashes found in them having been brought in from some other place.

All the remains found in the mounds had been buried in the flesh, the earth in contact with the bodies being deeply stained by their decomposition.

As before stated, the earth from which the mounds were constructed was a yellow, clayey material, unlike that of the surface of the region, and had been brought in from some other place, at a greater or less distance from the mounds.

No relics of any description were found with the bodies exhumed, and as for field relics, none are reported from the region.

Owing to the lack of time, mounds Nos. 5 to 8 have not, as yet, been explored.—CLEMENT L. WEBSTER, *Charles City, Iowa.*